Integrating Concepts of Material Mechanics, Ligand Chemistry, Dimensionality and Degradation to Control Differentiation of Mesenchymal Stem Cells.

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Public Summary:
The role of substrate mechanics in guiding mesenchymal stem cell (MSC) fate has been the focus of much research over the last decade. More recently, the complex interplay between substrate mechanics and other material properties such as ligand chemistry and substrate degradability to regulate MSC differentiation has begun to be elucidated. Additionally, there are several changes in the presentation of these material properties as the dimensionality is altered from two- to three-dimensional substrates, which may fundamentally alter our understanding of substrate-induced mechanotransduction processes. In this review, an overview of recent findings that highlight the material properties that are important in guiding MSC fate decisions is presented, with a focus on underlining gaps in our existing knowledge and proposing potential directions for future research.

Scientific Abstract:
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